Technical Panel
of the
Nebraska Information Technology Commission

Video Architecture
Video Standards for Distance Learning

COMMENTS RECEIVED

COMMENT #1	Tom Carlstrom, Superintendent, Humphrey Public Schools

This is my first public comment on the two video standard finalists selected for interactive distance learning: MPEG-2 and H.323/H.263 video.

The public comment period will extend until October 15, 2001. As I stated, this is my FIRST public comment, more will be made with additional data.

My concern lies in the actual performance of two-way interactive distance learning applications. The present JPEG equipment is meeting the needs state wide where the applications are actually being made. My concern lies with the possibility of being saddled with H.323 which is not "labeled" as a broadcast standard. How it would interact with other applications and most importantly, would it meet our needs and expectations is my initial concern? Are the tests going to include the actual applications which would meet the criteria for Rule 89? If we have to "use" what the new state standard is, I want to make sure the decision is not made in a clinical climate but should come from actual trial applications and consideration for an effective state wide network which we want to be part of.

INITIAL RESPONSE (Mike Beach):

The Technical Panel will review and provide answers to public comment before recommending a standard to the NITC. But here's a quick note to answer you questions. H.323 is capable of full-motion as is MPEG-2. The issue is at what data rate it accomplishes full-motion. As a committee, with input from the Education Council, we included 4 quality levels in the criteria for judging: full-motion, American Sign Language capable (for ASL users/instructors), lip readability (for language teachers), and minimum (NVCN/NebSat). We will compare the data rates of each standard required to reach each of these qualities with a goal to determine if one is more efficient than the other.

As for rule 89, NDE has sponsored several meetings with several members of our work group and both phone company and cable system reps. We talked about all these issues, and all the vendors seem cooperative. The follow-on piece to this whole process is creating a suggested migration strategy. This may allow for some new systems to come up on an older standard and migrate later if their contract has a long time left. It will also necessitate the use of temporary gateways from time to time as a new site waits for it's pod to upgrade. Once the specific standard is set, the migration strategy can be determined. Some of that ground work is already happening. All of this standard work is being intricately reviewed by NDE to assure compliance with LB833 and a smooth transition. There is a current provision in rule 89 for grandfathering for just this reason.

In reality, the only piece of equipment effected by this standard is the codec. All the classroom equipment would be the same. Only the codec is effected. In the case of the phone companies, it's part of the lease fee. I'm not sure with the cable systems if the school owns or leases the codec. There seems to be some confusion about that.

TECHNICAL PANEL RESPONSE:

COMMENT #2	Tom Carlstrom, Superintendent, Humphrey Public Schools

As promised, I would submit more than one public comment in this window of opportunity of submitting them.

I would like to bring to your attention the studies done in Kansas from the KDLC (KANSAS Distance Learning Consortium) Video and Audio Test Report. The results are interesting. Kansas has chosen MPEG 2 for distance learning and high quality video programming and H.263 as the video standard for videoconferencing. Interesting to note, they state in their report: "To reiterate, the H.261 and 283 video standards were designed for talking head or low motion video sources. While today's H. 261 and H.263 codecs handle high motion content video fairly well, these systems were designed to operate over low bandwidth circuits, using available interconnections and to save costs. . . . . The MPEG 2 standard was designed for broadcast transmissions and will, at a lesser data rate than a non-compressed system provide very high quality video and audio program delivery, depending on the data rate".

I would like to request H.263 and MPEG 2 be field tested in actual applications in the best test - rural Nebraska, at a number of different data rates so we can judge performance in actual distance learning classrooms. I am concerned about the distance learning capacity for the state and not the videoconferencing which other entities are interested in. Is it possible to do like Kansas and have two? One for distance learning and one for videoconferencing?

Our grant application for Rule 89 has to deal with quality. From what I have expereienced in my "research", I do not know if H.263 is the right application for 1 send 3 receive broadcasting like the standard of other public school distance learning capacity is. If the band width was increased to make H.263 comparable to present distance learning rooms, how much would it cost? These are the tests we want to evaluate.

TECHNICAL PANEL RESPONSE:

COMMENT #3	Tom Carlstrom, Superintendent, Humphrey Public Schools

H.323 is an IP standard and therefore must live with the original design parameters of the
Internet. H.323 networks would have to work in conjunction with other data traffic in a shared network environment. This sharing may work well for data, but it may not work well for video and audio. Schools are using the internet service more and more. Already, many schools experience a slow down in service with heavy usage. What would happen if we put distance learning classroom transmissions on top of it? We need to make sure the video and audio quality for distance learning in high school classrooms be based on the highest level of performance at the best price. How much additional band width would be needed to guarantee the equivalent of the present JPEG systems with dedicated lines for quality service?

There is no doubt that schools using the JPEG systems with dedicated service feel quite satisfied with the systems. Who can say the H.323 could deliver an equivalent or even improved quality? Again, we are talking about high school applications and I can not think of many students who would be willing to put up with moving lips and sound which do not match up.

Again, the present JPEG systems work well. From what I know, MPEG 2 is an improvement over JPEG which is not being manufactured anymore. MPEG 2 requires less band width which could be a cost savings for school when they are purchasing dedicated service for quality factors.

In addition, a gateway between JPEG systems in operation and future MPEG 2 systems seems much less complicated than a gateway between JPEG systems and H.323.

Was H.263, designed to be a full motion system like MPEG 2 was?
Is IP actually a broadcast system with QUALITY video/audio?

The last point of emphasis I want to share is another concern with an IP system. If the system uses the internet, would it be subject to VIRUS? How fast could a virus take the system down? On the other hand, can a virus take a dedicated system like JPEG or MPEG down?

How about an actual field demonstration of the video and audio performance over systems in rural Nebraska? How do these systems perform at various data rates and with a variety of video and audio material like a classroom teacher teacher may incorporate to have a high quality classroom presentation?

TECHNICAL PANEL RESPONSE:

COMMENT #4 Mark Hildebrand, Telecommunications Technician, Chadron State College

Tom,

Jereme and I have been doing some research on our end of things. With the limited bandwidth connections available in the Chadron area we have been looking at using MPEG-1 compression instead of MPEG-2. According to our research MPEG-2 works well from 3-15 Mb/s and MPEG-1 works better at lower bit rates including 1.5 Mb/s and lower which would include point to point T1 connections. If it is possible to have a network created in this area that would allow us to do MPEG-2 or H.323 over IP we would consider it, but it looks like the bandwidth costs would be even higher than they currently are.

I was informed by Roger Bartlett from Qwest that the MPEG-2 is what would work well for the ESU pods to replace the JPEG compression at a lower bandwidth usage and that H.323 will be best to replace the current NVCN system.

Because our system is connected to the current NVCN system for us to change to a different format we would have to set up a gateway between the two systems. This would be done by connecting a MPEG-1 CODEC to a current Vtel H.320 CODEC with video and audio. This would allow classes and conferences to still connect through sidney to the NVCN network.

Let me know what information you have on the dicisions the state is making in requirments. We feel that it will make it very difficult for our area to comply with standards that require higher bandwidth than is available. Our goal is to drop our monthly circuit switched T1 line costs to campus. We have found that Packet switched T1 lines to chadron from all

our sites would cost less than half as much a month and would allow multiple added features for our sites systems. Please keep Jereme or I could be included in the demonstrations and discussions. Because we are the technicians for this department we know the ins and outs of our system better than Pat does.

Thanks

TECHNICAL PANEL RESPONSE:

COMMENT #5 Shirley J. Schall, Director, Southwest Nebraska Distance Learning Consortium

Tom,

Thanks for the information on the set-up for testing the video formats.

I have to tell you that I am still troubled by the fact that the trial will not be a "class" broadcasting from one site to three other sites at a distance. The reason I say that is because I have been corresponding with the folks at TeamSolutions (UK) Limited (the group listed on the NITC website); their engineers tell me that one of the problems with H.323 is that it degrades over distance. A controlled test in Lincoln won't show us that.

That is why I, and I think Nigel, also, suggested that the test involve sites in different towns to accommodate the "real world" issues. For the tests, is there any way that distance can be accurately simulated at NET?

TECHNICAL PANEL RESPONSE:

COMMENT #6 Raymond Huebschman EdD, Dean of Information Technology, Concordia University

This is a response to the current standards being considered by the State of Nebraska for distance learner. Concordia University of Seward Nebraska is not currently a part of the state system. We are a part of the Concordia University Network (CUENet). As such our 60+ sites located nation wide are currently running H.320. The CUENet is not considering changing to another formation. We are at present running PictureTel codecs models 600 and 900. Both will handle H.320 and H. 323. From our perspective we would prefer H. 323 in hopes that we might be able to tie into the state system at a future date.

TECHNICAL PANEL RESPONSE:

COMMENT #7 B.J. Peters, Coordinator, Western Nebraska Distance Learning Consortium, ESU 13

I am submitting comments in regards to the efforts of the Nebraska Information Technology Commission to establish a single video standard for the state of Nebraska's distance learning systems.

I was able to participate in the standards testing in Lincoln on October 3 and found the tests to be very enlightening. I was and am still concerned about the testing procedures not being a valid field test. I understand the comments being made that we were testing video protocols, not the networks they will run on. But at the same time until you see a distance learning system operate in the field; it is very hard to simulate that in a closed environment.

This is why I am concerned with the H.323 video standard. An IP video system is entirely dependent of the network it runs on. It degrades considerably with any drop in bandwidth and I am dealing with school systems that have marginal in-house computer networks. The cost to upgrade those networks would far outweigh any benefits the movement towards H.323 would provide.

Another point is the fact that those of us on the current J.PEG video systems, which by the way are over two-thirds of the high schools systems in the state, have grown accustomed to a high-quality audio and video system. The telephone companies serving us have told us that they cannot guarantee the same level of service if we convert to the H.323 system. But at the same time they have assured us that M-PEG2, while using considerably less bandwidth, will give us a product that is comparable to the current system.

At this time I would have to ask you to consider the M-PEG2 standard for the state to migrate our DL systems to. It would be the easiest migration path for the vast majority of the state's distance learning systems. All the industry research points to the fact that H.323 is still a number of years away from being a viable classroom instruction vehicle. Right now the H.323 products available are best used in a desktop conferencing setting, while M-PEG2 can be easily adapted to the current systems without a drop in quality.

Thank you for your consideration.

TECHNICAL PANEL RESPONSE:

COMMENT #8	Shirley Schall, Director, Southwest Nebraska Distance Learning Consortium. B. J. Peters, Director, Western Nebraska Distance Learning Consortium. Nigel Buss, Director, Niobrara Valley Tele-Partnership; Northeast Nebraska Learner's Academy; Northeast Nebraska Distance Learning Consortium; and North Central Consortium. Chris Petroff, Director, Central Nebraska Distance Education Consortium. Phyllis Brunken, Media/Production and Distance Learning Director, ESU 7. Diane Wolfe, Director, Eastern Nebraska Distance Learning Consortium.

This letter is in response to the proposed Video Standard for Distance Learning and the tests run on October 3rd and 4th.

First, we must express our appreciation to the NITC and NETV for allowing us to take part in this standard-seeking process. Needless to say, this is a very important task which will determine the technological fate of over 280 current and future two way interactive distance learning classrooms.

That said, some observations must be made. Obviously, the video standard protocol tests were run under ideal laboratory circumstances. This is a point of concern for those of us who feel that testing in a

laboratory situation is not as vigorous as testing which utilizes actual quad-site sessions incorporating multi-network switching and gateways. We feel such testing would give a more accurate picture of how the formats would perform in our day-to-day network situations.

That is in addition to the challenges presented on our average two-way interactive system where teachers transition back and forth among various forms of multimedia (including VCR tapes made on inexpensive video equipment), change camera views or zoom shots several times a class period, and constantly present different audio levels and video resolution needs as they move from location to location around the classroom. This doesn't even take into account the audio challenges presented by those students leaning back in their chairs, far from the microphones! Video and audio quality get an extensive workout in the real classroom, which, unfortunately, is rarely a professional sound studio painted gray or backdropped in blue curtains for the best visual contrast.

Since foreign language, music instruction, and sign language are integral parts of our classroom instruction, and since we regularly move in and out of our own consortia to connect with other networks, true stream measure, which greatly affects the delivered quality of these latency-sensitive subject areas, should include packet latency, packet jitter and packet loss. Did the tests performed at the NET studios include all three elements of the package? Were these stream measures of the ideal or the real?

As you know, H.323 uses both reliable and unreliable communications. Within the IP stack, unreliable services are provided; furthermore, unreliable transmission is a mode that promises nothing more than what the industry labels “best effort” delivery. Over 150 JPEG classrooms in the state are currently used to service which is much better than that; and, at the least, we have video contracts with our providers that will deliver that same high quality of service until 2006 or far beyond. None of us wants to see our video and audio quality lowered unless it absolutely has to be, and directors with new classrooms coming up soon also want the best quality possible for their K-12 students. Therefore, we have two main questions for you. How much compromise must our consortium schools, ESU’s and colleges make in video/audio quality? When would those of us with established networks be expected to make those compromises?

In looking at the two standards from which the Technology Panel currently must choose, some differences emerge which lead JPEG consortia in one direction. That direction is shared by a large Technology Challenge Grant project for high quality, two way interactive, full motion distance learning, under way in Michigan at this time. They chose MPEG-2 technology over H.323 for three reasons, which are quoted below:

“1) H.323 is more suitable for two-way conversations than distance learning.
2) H.323 is still being ‘tweaked’ for network quality, scalability, and dialing schemes.
3) H.323 has no inherent QoS mechanism and will conflict with the data and voice applications sharing the same WAN connections.” (Iosco Regional Educational Service Agency Technology Challenge Grant, Cycle

4).

It should be noted that the Michigan network transport will allow the capability to also provide both H.321 and H.323 without any modifications.

To add further credence to the choice made in the Michigan project, we point to the Telecon 2000 International Conference held in Anaheim California last December 7th, at which an Industry Roundtable Discussion was held. Entitled "Videoconferencing Today--Where Are We Headed?," the CEO's of PictureTel, Polycom, Tandberg Inc., and VTEL went head-to-head on several telecommunications topics. On only one thing did all four men agree; that was a statement by Norman Gaut, CEO of PictureTel, who said: "IP video is still three to five years away from the level of quality needed for educational applications." This seems to back up what those involved with the Michigan distance learning project are saying.

Nortel Corporation, experts in world-wide telecommunications, echo these sentiments as they describe the differences in the two proposed standards by saying that MPEG-2 provides very high quality videoconferencing and is capable of offering super quality images, while H.323 simply does not deliver video with the consistency or quality required for successful two way interactive distance learning.

What we need at the state level is, of course, a network which is expandable and "future-proof," with enough headroom to assure that as telecommunications technologies improve, the system will not quickly become antiquated. It appears that all of the research, testimony and comment by telecommunications industry leaders, and advice from our classroom equipment vendors, installers, and network providers lead us to believe that the next best thing to the JPEG systems we now use would be the MPEG-2 format. We know that others in the state, particularly those who must look first at economic elements or who do not need the video quality which K-12 networks must have, might feel the same way about the H.323 or H.321 standard.

Rather than forcing all current systems in the state to migrate to a single standard, would it not make more sense in time, effort, and money to create a system that allows for video services ranging from MPEG-2 to H.321 and H.323 on the same ATM switching platforms which could provide transcoding and internetworking between codecs? In addition to the project in Michigan, the State of South Carolina has such a network (iSCAN), in which each MCU allows up to sixteen MPEG-2 users in multiple different sessions, whether it be all sixteen in one session, or four conferences with four users in any mix of MPEG-2, H.321 and H.323.

In conclusion, it appears that other states are planning and operating networks which allow different standards to move seamlessly back and forth, interconnecting as needed, yet the NITC proposes to set up what some would describe as a "one standard fits all" statewide system. We respectfully submit that this not what Nebraska needs.

Sincerely yours,

TECHNICAL PANEL RESPONSE:

COMMENT #9	Roger Hahn, Executive Director, Nebraska Information Network

The Nebraska Information Network offers the following input regarding the NITC Technology Panel's analysis and setting of Video Standards for the State of Nebraska:

Obviously there are many different applications for video being used for distance education in the State of Nebraska. Different applications have different video and audio quality requirements and thus it is our belief that minimum standards should be set for varying applications.

Where very high quality video is an absolute requirement, like in the kindergarten through twelfth grade education application, we support the selection of MPEG 2 with ATM transport. All new consortium applications should be MPEG 2 with ATM transport. Existing MPEG 1 and JPEG served consortiums/applications should be allowed to continue their development with existing technology as appropriate to provide the most cost effective solution for the educational entities involved.

In applications where lesser quality video and audio meets the users needs, and there are other driving considerations, H.323/H.263 should be the minimum standard ..... H.263 video with the H.323 application and not H.261 video.

In choosing which technology to use, given that both MPEG 2 and H.323 with H.263 video, provide the quality of video and audio that is needed, the decision should be based on minimizing bandwidth needs in the backbone network that connects consortiums/applications state wide. Bandwidth is not an issue within the consortiums with connections to hubs or video switches as transport in those areas is on existing fiber that all providers have priced as inexpensively as narrower bandwidth increments. Connectivity within a consortium, i.e., educational site to a hub or video switch, is for the most part on fiber where the capacity will never be fully used. Pricing on state wide connectivity routes is impacted by alternative revenue producing uses.

The statement in the paragraph under the heading of compatibility, in Section □C□, needs to be reconsidered, i.e., □all synchronous distance learning entities in the state must adopt this new video and audio standard to use state-owned networks, or to request future state funds ....□ For instance, the continuation and enhancing of the existing JPEG served consortiums will likely provide the best quality and most cost efficient service for many educational sites for decades in the future.

Where consortiums are being provided excellent quality and reliable distance education service, it should be permissible to use state funds to enhance the existing technology. For instance, the adding of video on the second T-1 in a JPEG network is being considered/planned by several consortiums. This is a very .... very cost effective way to have a second video network within a consortium to use for administrative conferences, a single (maybe two) person class, tutoring students, etc. Having the opportunity to use state funds for this kind of an enhancement or expansion of existing technology is very important as rural school districts continue to find the most cost effective way to provide a quality education for their students.

For many of the existing consortiums the most cost effective way to continue having access to high quality distance education is to negotiate a new contract for the existing technology when the current contract expires.

Continuing with the same paragraph in the Technology Panel document and referencing the last sentence ..... establish statewide interoperability of all synchronous distance learning networks while minimizing the fiscal impact; this will be achieved, most likely, by the placement of gateways to interconnect the technology that most effectively serves the educational entities in each consortium(s). As an added point, interoperability needs to be defined. Some of what might be called interoperability issues, such as remote camera control, have been stated by the users to be of minimal added value. Thus gateways do not need to provide for the pass through of remote camera control, etc.

Thank you for the opportunity to provide input to your process.

TECHNICAL PANEL RESPONSE:

COMMENT #10 Bob Tupper, Chief Telecommunications Engineer, RVW, Inc.

RVW, Inc. makes these comments on behalf of K & M Telephone Company (K & M) of Chambers, Nebraska. K & M is a local exchange carrier (telephone company) and has been providing high quality video distance learning service in its service area for several years. RVW, Inc. (RVW) is a professional engineering firm specializing in telecommunications. RVW has over 40 years of experience in telecommunications including over 20 years of experience in cable television system planning, design and implementation and over 10 years of specific experience in distance learning in Nebraska, Kansas and Colorado.

RVW, on behalf of K & M makes the following comments:

1. Although technology in the arena of video conferencing and video distance learning has been evolving continuously for several years, it is changing at an exceptionally fast rate right now. Earlier frequency division and time division multiplexed systems are no doubt being seriously challenged by packet and cell based digital technologies. However, at this time there is no clear-cut technical "winner". The two technologies being considered in the subject draft, MPEG-2 and H.323 with H.263 Video are strong candidates for presently developing networks; however, in our opinion it would be premature to designate either of these technologies as the single technology for all applications. Certainly H.323 with H.263 will be adequate and cost effective for many applications; however, for high-quality applications such as used in secondary education which typically include foreign language classes, MPEG-2 would cost-effectively provide the more stringent quality. Furthermore, the Authority and Responsibility described in the subject draft, Sections A and F respectively, do not appear to require NITC to designate a single standard but rather require NITC to "…adopt minimum technical standard**s**…" (emphasis added). Therefore, it would be far wiser for NITC to accept both MPEG-2 and H.323 with H.263 video as meeting minimum standards. Given the accelerating rate of technological change, even this could be a relatively short-term solution and NITC needs to be prepared to add to

this list as the technologies evolve.

2. It is suggested that Section B of the Draft be modified to specifically include the consideration of economics as follows,

   B. Purpose and Objectives

   The purpose of this document is to define and clarify policies, standards, and guidelines that will enable all existing and future interactive distance learning facilities to *economically* achieve interoperability and an acceptable quality of service for all educational applications.

3. Many secondary and post-secondary schools in Nebraska are presently participating in very successful distance learning projects based on Motion JPEG codecs and time division multiplexed DS-3 transport and switching. These systems are cost effectively providing an extremely valuable resource to Nebraska. These systems provide very high quality video and audio, are easy to use and are extremely reliable. NITC should not only grandfather these systems and this technology for the duration of all existing, typically 10 year, contracts; but also specifically allow the extension of these existing Motion JPEG systems to include additional schools and allow the existing contracts to be amended for at least an additional 5 years beyond the end of the existing contract terms. To do otherwise could very well preclude some schools from being able to afford the benefits of distance learning.

4. The subject Draft contains an inadequate definition of ATM. The following is offered in its place,

   "ATM means asynchronous transfer mode. *ATM is a standards based technology that uses short, fixed length packets (called cells) to control latency in networks used to carry mixed voice, video and data traffic*."

Thank you for allowing K & M Telephone Company the opportunity to comment on this draft and thereby continue to assist education in the communities K & M serves to the betterment of the State of Nebraska. Please let us know if there are any questions regarding any of the above.

Very truly yours,

TECHNICAL PANEL RESPONSE:

COMMENT #11	Thomas L. Krepel, Ph.D., President, Chadron State College

I appreciate the proactive approach of the Nebraska Information Technology Commission (NITC) in dealing with the issue of standards for State supported telecommunications technology. With a service area that is equal to one half of the State of Nebraska, I am sure you understand how vital a reliable and high quality telecommunications system is to the distance learning program of Chadron State College. Because of CSC's vital interest in telecommunications, I am asking the Commission to carefully consider several issues prior to adopting an official video technology standard to be used by all state-supported users.

First, it is my understanding that prior to a vote on October 15, 2001 to adopt either the H.323 or MPEG 2 standard for video telecommunications, a test of these protocols will be made under simulated conditions in Lincoln. I am very concerned that a decision of this magnitude will be made without a complete and "real" test under normal operating conditions, including a live connection to multiple distance locations using all of the typical classroom video sources. Using digital videotape in a closed network simulation in Lincoln to demonstrate either of these technologies' ability to the deliver reliable high quality audio and video instruction to locations throughout Nebraska is viewed with considerable skepticism.

Second, it is of great concern to Chadron State College that the NITC is evaluating two very infrastructure-robust standards that appear to be in direct conflict with the capability of the current bandwidth infrastructure that is available in western Nebraska. Assuming that one of these standards is adopted, what are the assurances that the necessary and timely infrastructure upgrades will accompany the deployment of the new standard? Additionally, what are the guarantees the new standard will actually work in our region, and what are the consequences if they do not?

My third concern is who will pay for upgrading to the new standard. As you know, there is a very real concern in the Governor's office for the ongoing revenue shortfall in the State. The College, like many other institutions, is struggling to accommodate expected budget reductions and still maintain current operations. Including support equipment needs and potential ongoing costs, the expenses associated with a retooling of the scope implied by adoption of a video standard are potentially enormous. From where will the resources come?

The technicians at Chadron State College also have specific concerns about these proposed technologies. These include:

- Reports indicate that the H.323 standard is not suitable to classroom application, and probably will not be suitable for at least 3-5 years.
- Quality of service issues are inherent to H.323, especially if it is not running on ATM, which we in Chadron do not have.
- Much of the western part of the State does not have sufficient bandwidth to provide the same quality of service and satisfaction through H.323 as portions of the State that do have sufficient bandwidth. Service providers in western Nebraska will not guarantee quality of service with H.323 transmitted over packet switched T-1 lines, which are also limited in this area.
- Various technicians in the ESU "pod" systems have expressed concerns about H.323, including those located in areas with sufficient bandwidth.
- According to our technicians, both MPEG 1 and MPEG 2, provide higher quality of service than H.323 at the same bandwidth.

Again, I applaud the NITC for moving forward with efforts to standardize video technologies in the State. However, I believe there are several issues that need to be resolved before the selection of a specific standard is made. It seems that there is haste to make this decision at the expense of thoroughly assessing all of the pros and cons, including the timeline for deploying the new technology. I urge caution before deciding this issue until all of these questions and issues are resolved to the satisfaction of the ultimate users, especially those who are challenged with additional

infrastructure issues.

Thank you for your consideration. Please contact me at your convenience if you wish to discuss this matter with me.

TECHNICAL PANEL RESPONSE: